

**Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal**

Section 1. General administrative information

**Evaluate The Feasibility And Risks Of Coho
Reintroduction In Mid-Columbia .**

Bonneville project number, if an ongoing project 9604000

Business name of agency, institution or organization requesting funding
Yakama Indian Nation

Business acronym (if appropriate) YIN

Proposal contact person or principal investigator:

| | |
|------------------------|----------------------------|
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Subcontractors.

| Organization | Mailing Address | City, ST Zip | Contact Name |
|---------------------|----------------------------------|---------------------------|---------------------|
| USFWS | 3704 Grffin Lane SE Suite 101 | Olympia, WA 98501-2292 | Ray Brunson |
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| | | | |
| | | | |

NPPC Program Measure Number(s) which this project addresses.

7.1H, 7.4A, 7.4O, 7.4F

NMFS Biological Opinion Number(s) which this project addresses.

Consultation # 383; Endangered Species Act Section 7 Biological Opinion on 1995-1998 Hatchery Operations in the Columbia River Basin.

Other planning document references.

Wy Kan Ush Me Kush Wit, Spirit of the Salmon

Subbasin.

Methow, Wenatchee

Short description.

Determine the feasibility of re-establishing a naturally spawning coho population and a significant fall fishery for coho within the mid-Columbia, while keeping adverse ecological impacts within acceptable limits,

Section 2. Key words

| Mark | Programmatic Categories | Mark | Activities | Mark | Project Types |
|------|-------------------------|------|------------------|------|-----------------------|
| X | Anadromous fish | + | Construction | | Watershed |
| | Resident fish | + | O & M | + | Biodiversity/genetics |
| | Wildlife | X | Production | + | Population dynamics |
| | Oceans/estuaries | + | Research | + | Ecosystems |
| | Climate | + | Monitoring/eval. | + | Flow/survival |
| | Other | + | Resource mgmt | + | Fish disease |
| | | + | Planning/admin. | X | Supplementation |
| | | | Enforcement | | Wildlife habitat en- |
| | | + | Acquisitions | | hancement/restoration |

Other keywords.

Fish enhancement/restoration, hatchery/wild interactions, ecological interactions, life history, predation, sampling, risk analysis/containment

Section 3. Relationships to other Bonneville projects

| Project # | Project title/description | Nature of relationship |
|-----------|--|--|
| 9603302 | Yakima River Coho Restoration | Similar goals/objectives/strategies |
| 9603401 | Methow Valley Irrigation District Conversion Project | Habitat restoration to improve instream flows in Methow basin. |
| 0 | | |
| 0 | | |

Section 4. Objectives, tasks and schedules**Objectives and tasks**

| Obj 1,2,3 | Objective | Task a,b,c | Task |
|-----------|------------------------------|------------|-------------------------------|
| 1 | Determine the feasibility of | a | Acclimate all of the imported |

| | | | |
|---|---|---|--|
| | returning natural production of coho salmon to mid-Columbia tributaries including evaluating their reproductive success. | | smolts |
| 1 | | b | Monitor outmigrating smolts using screw traps. Expansion of sample catches collected in the trap will be used to estimate total passage of smolts from the basin |
| 1 | | c | Determine the smolt-at-release to smolt-at-McNary Dam survival (relative) and passage time using pit tags in a random number of the acclimated smolts 1 |
| 1 | | d | Monitor returning adults at Wells Dam, the Winthrop NFH, and through spawning ground surveys. |
| 1 | | e | Conduct redd capping the following spring to monitor the success of spawning and incubation. |
| 2 | Determine the potential harvest benefits from reintroduction of coho salmon in the Wenatchee/Methow river basins | a | Calculate potential harvest benefits. |
| 2 | | b | Monitor and evaluate tribal and non-tribal salmon fisheries in ocean, in-river, and if appropriate terminal tributary areas. |
| 3 | Determine the predation impacts of releasing acclimated coho smolts on summer chinook, bulltrout, steelhead, and spring chinook and other populations of concern in the Wenatchee/Methow river basins | a | Document size of co-existing species of concern during the period of overlap with hatchery coho by sampling weekly using beach seines and electroshockers for fork length and mean weight |
| 3 | | b | Determine spatial and temporal distribution of the species of concern with respect to that of hatchery coho from their time of release using YIN, WDFW, and USFS habitat inventory databases |
| 3 | | c | Determine if there is evidence for hatchery coho predation upon the |

| | | | |
|---|---|---|---|
| | | | species of concern by collecting coho stomachs from reaches of maximum overlap using screw traps |
| 3 | | d | From above tasks, determine window of vulnerability by coho predation on the species of concern |
| 3 | | e | Investigate potential interaction between hatchery coho and the species of concern by snorkling most likely at night in different macro-habitat type (pool, riffle, runs, side channels, backwater). |
| 4 | Determine the predation/interaction impacts of F2 generation coho juveniles on species of concern | a | install an up/downstream weir(s) on selected tributaries or small side channels. Capture from these weirs plus electroshocking would be used to describe the current species presence and abundance including F2 coho |
| 4 | | b | Monitor the sites throughout the winter and into the spring on a monthly or bimonthly basis. |
| 4 | | c | Measure: number of emigrants/immigrants; length and weight distribution; condition factor, and macro/micro-habitat preference relative to that which is available; |
| 4 | | d | Snorkel surveys to evaluate coho interactions with other species within specified reaches |
| 4 | | e | Stomach content analysis would be conducted from a random sample of juvenile F2 coho on a seasonal basis to look for predation. |
| 5 | Examine the general fish health and survival of the hatchery F2 coho | a | Within and outside the study sites, collect random samples of fish on a monthly or bimonthly basis to examine the health of the fish by a certified pathologist. |
| 5 | | b | Within the study sites measure the over-winter survival rate accounting for any emigration/immigration. |

Objective schedules and costs

| Objective # | Start Date mm/yyyy | End Date mm/yyyy | Cost % |
|--------------------|-------------------------------|-----------------------------|----------------------|
| 1 | 5/1998 | 12/2015 | 58.00% |
| 2 | 12/2000 | 12/2015 | 3.00% |
| 3 | 5/1998 | 6/2000 | 12.00% |
| 4 | 3/2000 | 12/2006 | 25.00% |
| 5 | 3/2000 | 12/2006 | 2.00% |
| | | | TOTAL 100.00% |

Schedule constraints.

NEPA determinations, significant impacts on other species by coho, inadequate funding, inability to get scientific measurements resulting in a change of experimental design , current environmental issues making restoration infeasible.

Completion date.

2025

Section 5. Budget***FY99 budget by line item***

| Item | Note | FY99 |
|---|---|--------------------|
| Personnel | Admin, Bio, Techs, Research | \$195,000 |
| Fringe benefits | 20.0% | \$39,000 |
| Supplies, materials, non-expendable property | | \$70,000 |
| Operations & maintenance | Includes M & E costs | \$250,000 |
| Capital acquisitions or improvements (e.g. land, buildings, major equip.) | Acclimation facility and M/E equipment, land, buildings | \$95,745 |
| PIT tags | # of tags: 10,000 | \$29,000 |
| Travel | Project oversight, M/E and fish propagation crews | \$50,000 |
| Indirect costs | 23.5% FY 1997 rate | \$171,255 |
| Subcontracts | Design, engineering , construction | \$470,000 |
| Other | | |
| TOTAL | | \$1,370,000 |

Outyear costs

| Outyear costs | FY2000 | FY01 | FY02 | FY03 |
|----------------------|---------------|-------------|-------------|-------------|
| Total budget | \$2,690,000 | \$3,040,000 | \$3,030,000 | \$2,960,000 |
| O&M as % of total | 22.00% | 21.00% | 29.00% | 30.00% |

Section 6. Abstract

The management and scientific principles guiding the Yakama Nation's ceded-area salmon restoration programs are fully described in the Columbia River tribes' salmon restoration plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit*, Spirit of the Salmon. Within the Mid-Columbia River Basin, the overall goal is to restore salmon populations, including coho, and their natural habitats to levels of abundance and productivity sufficient to support sustainable annual harvests by Tribal and other fishers.

The protection, mitigation, and enhancement of fish and wildlife resources of the Columbia River and its tributaries is one of the major goals of the Northwest Power Act. The Act requires that the Northwest Power Planning Council (NPPC) develop a program to protect and rebuild Columbia Basin fish and wildlife resources (NPPC, 1994). As part of this effort, the NPPC directed the region's fish and wildlife agencies, and Indian tribes to develop a system wide plan for rebuilding fishery resources. This included development of 31 integrated subbasin plans for major river drainages in the Columbia Basin.

The NPPC also recognized the value of scientifically supported supplementation programs for the rehabilitation of weak wild and naturally spawning populations. In summarizing recent amendments to their Fish and Wildlife Program the NPPC stated, "As part of updating the subbasin plans, agencies and tribes will propose supplementation projects to help rebuild naturally spawning salmon populations" (NPPC, 1994).

It is expected that progress toward meeting the goal of this plan will be realized through the use of implementation plans. Implementation plans (IPs) will be developed or reviewed with relevant fishery managers. The IPs will specifically describe proposed resource management actions including information such as the size, lifestage, objectives/constraints/risks and locations of Mid-Columbia basin coho releases and M/E objectives. Frequent reviews of the IPs will allow use of the most current information (i.e., expected escapements, habitat conditions, monitoring and evaluation results, etc.) to ensure the effectiveness of the IPs in achieving the stated goal of this plan. It is further expected that IPs will be modified as necessary to accommodate changing management priorities and restoration opportunities.

Because coho are extirpated from the mid-Columbia, it is anticipated that the project will require upto a couple of decades to achieve its overall goal of restoration. The initial phase is focused on feasibility/risks with intensive M & E to evaluate expected outcomes.

Section 7. Project description

a. Technical and/or scientific background.

Indigenous, natural coho salmon no longer occur in the mid-Columbia river basins. Major historical production areas for mid-Columbia coho salmon occurred throughout much of the basin's tributaries. Mullan (1983) estimated historical mid-Columbia River coho populations as follows: Wenatchee, 6,000-7,000 coho; Entiat, 9,000-13,000 coho; and Methow, 23,000-31,000 coho. This project proposes to restore natural coho populations in place, in kind in the above mentioned tributaries. Coho is a critical species targeted for restoration in the Columbia River treaty tribes' salmon restoration plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit*, Spirit of the Salmon. NMFS has also concluded that this project qualifies as a "high priority" project as demonstrated by endorsing this project and 14 other supplementation projects in the *US v Oregon* policy arena. This project also is a production measure contained within the 1997-98 Coho Management Agreement developed by parties under *US v Oregon*. Optimism exists on the technical feasibility of restoring coho by evaluating data from other Columbia River tributaries in the "All Species Review" document compiled by technical representatives of *US v Oregon*. Just by acclimating reprogrammed hatchery coho to the Yakima River, the YIN has significantly improved fish survival. Three facilities were developed to acclimate and improve the survival of the 700,000 early run coho that are reprogrammed annually to the Yakima River under the Columbia River Fish Management Plan. Although tag recovery and escapement data from these acclimated releases in the Yakima River are still preliminary, the data provides support that acclimation is beneficial to the survival of upriver releases. For example, on the basis of tag recoveries per 1,000 fish released in 1994 (1995 returns), acclimated Yakima River coho survived 2 to 4 times better than direct stream releases from previous years (except 1994 returns), 4 times the Little White releases, 1.3 times the Umatilla releases and equivalent to the Tanner Creek releases in the lower river. The 1996 returns indicated an even greater increase in survival over 1995. Also, dam counts at McNary and Prosser dams indicate that returns in 1995 and 1996 (the first 2 years of acclimated returns) "homed" to locations above Prosser Dam in the Yakima River better than in any prior year. Finally, the in-basin smolt to smolt survival as measured at the Chandler Juvenile Monitoring Facility located at Prosser indicates a 400 to 500% increase with fish that are acclimated versus those planted with a direct stream release. Unacclimated releases of reprogrammed hatchery coho produces at most 200-300 adults whereas the more recent returns of acclimated releases has returned upto 1500 adults.

b. Proposal objectives.

1. EXPERIMENTAL OBJECTIVE - Determine the feasibility of re-establishing a sustainable, naturally spawning coho population in the Wenatchee and Methow basins with sufficient productivity to sustain a meaningful in-basin fishery in most years by strategically releasing initially 750,000 smolts into each basin and monitoring

reproductive success and F2 ecological interactions from the estimated 1,000 - 1,300 adult returns per basin.

2. NATURAL PRODUCTION OBJECTIVE - Optimize production of naturalized populations of coho with respect to abundance and distribution.

3. ECOLOGICAL INTERACTIONS OBJECTIVE (1) - Keep adverse impacts of coho reintroduction and supplementation on non-target taxa of concern (NTTOC) within acceptable limits.

4. ECOLOGICAL INTERACTIONS OBJECTIVE (2) - Limit losses of wild and hatchery smolts to native and exotic predators to levels that do not significantly limit coho production potential.

5. GENETIC OBJECTIVE - Establish a distinct Wenatchee and Methow coho stocks with heritable life history traits adapted to each of the basins.

6. HARVEST OBJECTIVE - Expand harvest opportunities for treaty Indian and sport fisheries inside and outside of the Mid-Columbia while meeting objectives for genetics, experimentation, natural production and ecological interactions.

c. Rationale and significance to Regional Programs.

Policies for protecting and enhancing fishery resources in the Pacific Northwest have evolved through a long history of international, national, and regional debate and negotiations. This history has resulted in a series of treaties, legislation, and litigation including: treaties between the United States and Northwest Indian tribes, including the Treaty of 1855 with the Confederated Tribes and Bands of the Yakama Indian Nation, the Pacific Salmon Treaty between the U.S. and Canada, the Mitchell Act, the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act), the Endangered Species Act (ESA), and the landmark federal court decisions regarding Indian Treaty fishing rights in *U.S. v Washington* and *U.S. v Oregon*.

During the past 15 to 20 years, many agreements and plans have been drafted in an attempt to resolve historical conflicts and move forward with the restoration of Pacific Northwest salmon runs. The following paragraphs give the legislative and legal context for, and describe the current intent of the region's fishery managers with respect to, rebuilding depleted fishery resources including coho.

NORTHWEST POWER ACT

The protection, mitigation, and enhancement of fish and wildlife resources of the Columbia River and its tributaries is one of the major goals of the Northwest Power Act.

The Act requires that the Northwest Power Planning Council (NPPC) develop a program to protect and rebuild Columbia Basin fish and wildlife resources (NPPC, 1994). As part of this effort, the NPPC directed the region's fish and wildlife agencies, and Indian tribes to develop a system wide plan for rebuilding fishery resources. This included development of 31 integrated subbasin plans for major river drainages in the Columbia Basin.

The NPPC also recognized the value of scientifically supported supplementation programs for the rehabilitation of weak wild and naturally spawning populations. In summarizing amendments to their Fish and Wildlife Program the NPPC stated, "As part of updating the subbasin plans, agencies and tribes will propose supplementation projects to help rebuild naturally spawning salmon populations" (NPPC, 1994).

MITCHELL ACT

The Mitchell Act, passed by the U.S. Congress in 1938, was an attempt to begin repairing damage caused to the Columbia River's fishery resources by upriver hydropower development. The Act contained mitigation funds for habitat repair and construction or enlargement of several hatcheries.

Coho salmon production has been funded by Mitchell Act appropriations for mitigation of the effects of Bonneville Dam construction on Columbia River anadromous salmon stocks. Most of these mitigation hatcheries were built below Bonneville Dam to supply fish for ocean and lower river commercial fisheries. Consequently, most Mitchell Act funding is expended for production of tule fall chinook and coho which support these fisheries.

Recent efforts to mitigate for upriver losses of chinook and steelhead natural production (i.e., John Day Dam mitigation, Lower Snake River Compensation) have appropriately provided facilities or release sites in upriver areas. Above Bonneville Dam, only 3 coho acclimation facilities in the Yakima River have been provided by Mitchell Act funds. However, some Mitchell Act production below Bonneville Dam has been reprogrammed for release sites above Bonneville Dam. Authority for transferring coho from facilities below Bonneville to locations above Bonneville Dam comes from *U.S. v Oregon* and from the U.S. Congress (1995 Appropriations language). Unfortunately, the program has only met with marginal success because of funding constraints prohibiting implementation of a sound, scientific program.

U.S. V OREGON MANAGEMENT GOALS

Section III.A of the Columbia River Fish Management Plan (CRFMP) states: "The Parties have joint and several responsibilities for conserving, rebuilding, and enhancing the anadromous fish of the upper Columbia River Basin. The intent of the Parties is to develop, and implement those agreed-to production orientated actions to achieve the goal of rebuilding upriver anadromous runs, as determined by indicator stocks, within 15 years

(three brood cycles). The production planning aspect of this Agreement is designed to assure that rebuilding and harvest allocation objectives are achieved concurrent with restoration of the runs. Present and future artificial production programs shall be integrated with natural production as described herein".

Section III.D.4 of the CRFMP states: "The Parties agree to undertake at least the following actions:

- a. evaluation of sites suitable for release of hatchery fish at levels of release compatible with natural propagation and harvest management;
- b. rearing and transfer of biologically appropriate fish from existing hatcheries to release sites in the Upper Columbia River Basin to restore natural spawning populations; and
- c. research to determine the effectiveness of these programs through improved methods of supplementing naturally spawning stocks with compatible stocks of hatchery fish in the Upper Columbia River Basin".

The CRFMP provides for an annual release of 1,000,000 coho from Lewis River Hatchery into mid-Columbia tributaries.

MID-COLUMBIA HABITAT CONSERVATION PLAN

The Mid-Columbia P.U.D.s (Grant County, Chelan County, and Douglas County) are presently negotiating a HCP with NMFS and USFWS on operation of their 5 hydroelectric projects. Other resource managers including the YIN, WDFW, and the Colville Tribe are also involved in the process. Through implementation of fish passage improvements at each project, habitat improvement measures, and hatchery compensation the obligation of the PUDs will be to have *no net impact* on fishery resources passing through their projects. Within 5 years, the PUDs will be obligated to achieve and maintain a performance standard of 95% juvenile dam passage survival for each species through the forebay, dam, and tailrace. Coho are listed in the HCP and will benefit significantly from protection under this plan.

METHOW VALLEY IRRIGATION DISTRICT CONVERSION PROJECT

Bonneville Power Administration (BPA) is assisting with the conversion of the Methow Valley Irrigation District's project in order to increase the efficiency of the MVID irrigation system. In doing so, BPA is responding to a need to increase in-stream flows and fish passage in the Methow and Twisp rivers for anadromous and resident fish. These subbasins in the Methow basin are historically natural production areas of coho salmon. This project also promotes the need for more efficient use of water in the Methow River Basin. The Washington Department of Ecology (WDOE) will co-fund a major portion of the project.

YAKIMA RIVER COHO RESTORATION

Project 960 3302, Yakima River Coho Restoration, has similar goals, objectives, and strategies to this project. Since the Yakima River project is under the umbrella of the YKFP, there will be more emphasis on research as it relates to supplementation than the mid-Columbia project. However, the overall goal of both projects is to determine the feasibility of re-establishing naturally spawning coho populations and a significant fall fishery for coho within the targeted areas, while keeping adverse ecological impacts within acceptable limits.

d. Project history

This project was implemented in FY 1996 after endorsement from the *U.S. v. Oregon* Policy Committee and the NPPC. In FY 1996, selected habitats and acclimation pond sites in the Methow and Wenatchee river basins were identified for the potential reprogramming of juvenile coho from appropriate lower river hatcheries. A project report evaluating the potential sites in both of these basins was written as part of contract compliance. In FY 1997, the Yakama Indian Nation initiated feasibility studies related to coho restoration of mid-Columbia tributaries by reprogramming early stock coho from lower river hatcheries to identified sites in the Methow River from FY 1996 activities. Because of the Yakama Indian Nation's and State of Washington's position to minimize risk with other species of concern (i.e. spring chinook, summer chinook and steelhead) as well as measure the success of this restoration project, a comprehensive monitoring and evaluation plan was developed and implemented in FY 1997. Review of the scientific literature supports restoration as it relates to impacts on other species. Stream dwelling salmonids in North America which have evolved in sympatry have developed mechanisms to promote coexistence and partition the available habitat (Allee, 1981). Studies with coho salmon and steelhead trout (Hartman, 1965; Fraser, 1969; Allee, 1974; Bustard and Narver, 1975a; Bisson et al., 1988; Spaulding et al., 1989; Fausch, 1992); chinook salmon and steelhead trout (Hartman, 1965; Johnston, 1967; Fraser, 1969; Everest and Chapman, 1972; Gibson, 1981; Spaulding et al., 1989; Bugert and Bjornn, 1991; Bugert et al. 1991); chinook salmon and coho salmon (Lister and Genoe, 1970; Stein et al. 1972; Spaulding et al., 1989; Taylor, 1991); and coho salmon and cutthroat trout (Bustard and Narver, 1975b; Glova and Mason, 1977; Glova, 1986) all support this fact.

In FY 98, the focus of the project will be on further risk analysis with intensive M & E to with strategically timed releases of reprogrammed coho from the lower river.

The restoration project endorses an adaptive management policy, which expects objectives and strategies to change as new information becomes available. An integral part of the project's adaptive management process revolves around three steps:

- 1). Completion of an updated long-range plan which is reviewed annually;
- 2). Completion of an updated long-range study plan to resolve uncertainties which is reviewed annually;
- 3). Annual peer review of work completed and in progress.

Results of uncertainty resolution work are reported in annual project reports and/or in project completion reports. Such reports are peer reviewed. Following annual reviews, all assumptions in the study plan are reviewed and reclassified and any new assumptions added. The implications of these revisions on the strategies and objectives are assessed along with risks and benefits, and amendment revisions are submitted for policy review.

While the justification for modifications of objectives and strategies may include technical judgment and policy preference, the changes in the state of uncertainty about assumptions are based on scientific evidence, hence the importance of peer review.

e. Methods.

The project is described in detail in the attached document “MID-COLUMBIA COHO STUDY PLAN” (YIN, 1997). This document discusses the status of project planning for Mid-Columbia coho salmon. This plan:

- presents background information.
 - describes objectives, i.e statements of what is to be accomplished in the genetics, natural production, experimentation, and harvest components.
 - states strategies that should accomplish these objectives and the assumptions on which these strategies are based.
 - outlines how the uncertainties inherent in each assumption will be managed.
 - explains the experiments designed to test supplementation.
 - presents the risk analysis conducted to describe management implications.
- describes, as appropriate, the facilities for broodstock collection, hatchery incubation and rearing, and acclimation.
- discusses the monitoring needs.

· presents citations for references used to document or support statements.

f. Facilities and equipment.

Facilities needed for the mid-Columbia coho experimental program include those for adult capture, holding and spawning, egg incubation, juvenile rearing, acclimation and release, and monitoring. To date, side channels and existing irrigation canals have been utilized for short-term acclimation and release in the Methow under the jurisdiction of the CRFMP. Ultimate coho salmon production numbers and the facilities required for production and monitoring in both Methow and Wenatchee watersheds will be determined after species interaction and productivity studies have been conducted.

Facilities will be required for fish originating from both in-basin and out-of-basin broodstock. Acclimation sites only will be required for the CRFMP, out-of-basin production since all other aspects of their culture will take place at the Lewis River Hatchery. In-basin production will also utilize the acclimation sites and will require the construction of new and/or expansion of existing central hatchery facilities. Existing adult coho trapping facilities at Wells Dam on the Columbia River and Tumwater Dam in the Wenatchee River basin will be used to collect in-basin broodstock.

Approximately a total of 12 acclimation ponds in the Wenatchee/Methow river basins will be needed. Each pond will be 12,000 cubic ft or larger and will require a minimum of 2.5 cfs of water. Existing ponds, side channels, and irrigation ditches in both basins are being investigated for this purpose. Sites are evaluated based on their biological suitability, accessibility, water supply dependability, water supply quality, and cost of site development. Each will require fish containment apparatus, water flow control structures, avian and mammalian predator protection, and a discharge channel from the rearing area to the river allowing safe smolt passage.

One central hatchery each is planned for the Methow and Wenatchee systems. The main siting criteria will be the location of suitable water supplies. Ideal supplies will include a combination of both ground and surface water and will need to total a minimum of 12 cfs. Potential ground water supplies considered originate from wells, springs, and gravel pits. Dependable intake structures will be a central feature of surface water supplies. The hatcheries will include adult holding ponds, incubators, fry rearing units, fingerling rearing units, and support facilities. Expansion of existing hatchery facilities in the Columbia basin will be considered as an alternative to new construction. Winthrop NFH, Wells Hatchery, and Rocky Reach Annex are candidates for such expansion.

Monitoring facilities will be identified through the development and implementation of the URP. They will meet the needs of the five levels of monitoring needed for the project and follow the hatchery practices, fish health, ecological interaction, and genetic policy

guidelines developed by the Integrated Hatchery Operations Team (IHOT) and endorsed by tribal, state, and federal resource managers.

Descriptions of specific project facilities and equipment follow:

Acclimation sites

Fish culture equipment - feed buckets, feed scoops, boots, rain gear, scales, sample nets, dip nets, dissolved oxygen meters, and thermometers are among the equipment to be used.

Snow removal equipment - several project pick-ups will have snowplow blades installed for light snow removal jobs. Major road clearing will be done by local contractors.

Alarm systems - alarm systems will sense low water levels and low flow conditions, then send signals via radio frequencies to an auto dialer which will notify personnel of the alarm status.

Hand tools - necessary tools include shovels, hand saws, hammers, wrenches, sledges, rakes, drills, skill saws, small portable generators, cell phones, etc.

Barrier nets - nets used to contain fish will be sized to meet the conditions at each site. They will be installed at an angle to the flow to maximize the net surface area. Trash nets will have a 1" mesh size, coho barrier nets will have a 1/2" mesh size, and fry barrier nets will have a 3/32" mesh size. Nets will have heavy weights attached to their lead lines and will be well anchored to the ground on the surface to prevent blowouts.

Screen structures - sites requiring screen structures will be built to meet the WDFW screen requirements. Screens will be sloped to allow for easy cleaning and to increase surface area.

Predator control - bird netting will cover suitable sites and wire mesh fencing will be added as needed.

Flow control - sites which do not have a means of controlling the amount of flow entering the rearing area will require removable structures constructed of sand bags and pipe. They will be located upstream of the barrier nets.

Feed and equipment storage - the WDFW, Methow hatchery will be used until the hatcheries are constructed.

Vehicles - a variety of vehicles will be utilized for the project, including full size pick-ups and light trucks.

Hatcheries

Water intake screens - sloped screen intakes will supply water to the facilities. The screens will meet WDFW criteria for approach velocity and screen mesh size.

Water supply pumps - low head pumps will supply rearing and incubation water. Multiple pumps per site will provide a safety back up. Generators with automatic transfer switches will provide power during outages. The pump and generator size will be site dependent.

Office/storage/incubation building - 50' by 24' buildings will be erected. They will have concrete slab floors and steel walls and roofs. The interior will be divided into office space, a storage/shop area, and an incubation room.

Incubators - fiberglass, deep tough incubators will incubate eggs and serve as first feeding units. Water and space will also be available for the installation of bucket incubators for individual females.

Fingerling raceways - steel raceways with vinyl liners will be used for holding ripening adults and early rearing of fingerlings. They will be 20' long, 4' wide, and 4' deep.

Rearing ponds - the main rearing units will be vinyl lined ponds, measuring 150' long, 50' deep, with a 4' water depth (22,000 cft). They will have sloped, concrete screen structures at the downstream end and a pipe manifold across the front end. They will be covered with predator netting. Each pond will be capable of holding up to 400,000 coho smolts.

Fish culture equipment - feed buckets, feed scoops, boots, rain gear, scales, sample nets, dip nets, dissolved oxygen meters, and thermometers are among the equipment to be used.

Office equipment - computers, printers, telephones, fax machines, radios, microwaves, refrigerators, sleeping bunks, desks, chairs, and file cabinets are needed. Provisions will be made to allow overnight stays in the office during storm events.

Tools - miscellaneous hand tools, miscellaneous fasteners and pipe parts, radial arm saws, drill presses, and storage containers will be included in the shops.

Alarm system - low flow and sensors will monitor low water levels. Alarm signals will be sent by wire to an autodialer, which will notify personnel.

Fish waste cleaning system - a vacuum will be generated by a high pressure pump and a venturi nozzle. Pipelines throughout the sites will allow attachment of cleaning heads to the vacuum system. Wastes will be removed from the rearing unit bottoms and stored in a waste pond.

Monitoring and Evaluation

Screw traps - portable traps to monitor migratory in-basin natural and hatchery production. Used to collect samples for stomach analysis and demographic data.

Snorkel equipment - used for visual monitoring of species habitat preference, ecological interactions, growth rates, adult carcass retrieval.

Beach seines - used to sample study reaches in order to collect demographic data on species of concern.

g. References.

REFERENCES:

Allee, B.A. 1974. Spatial requirements and behavioral interactions of juvenile coho salmon (*Oncorhynchus kisutch*) and steelhead trout (*Salmo gairdneri*). Doctoral dissertation, Univ. of Washington. 160 pp.

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Endangered Species Act. Submitted to Merritt Tuttle, Division Chief, National Marine Fisheries Service. November 1993.

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Section 8. Relationships to other projects

The four treaty tribes of the Columbia River have made coho restoration a priority as stated in the Tribal Recovery Plan, *Wy Kan Ush Me Kush Wit*. The Umatilla and Nez Perce tribes have implemented coho recovery plans under the FWP. The Umatilla Tribe has four coho BPA contracts that relate to restoration. *Umatilla Hatchery Satellite Facility Construction* (910 1400) involves construction of a coho acclimation pond in of 1998 on the Umatilla River. The O&M for this facility is funded by *Umatilla Hatchery Satellite Facility O & M* (834 3500). The Umatilla Tribe will be monitoring natural production/ecological interactions under *Evaluation of Natural Production in the Umatilla River* (900 0501) which is the monitoring program for the Umatilla Hatchery which includes coho. Finally, adult coho returning to the Umatilla River Basin will be included in the Tribe's trap and haul program at Three Mile Dam under BPA contract *Umatilla Basin Trap and Haul* (880 2200).

The Nez Perce Tribe (NPT) has placed a high priority on coho restoration in the Snake River Basin. They are implementing a plan for "Reintroduction of *Cuhlui* (coho salmon) in the Clearwater River basin". The NPT goal is "to reintroduce and restore coho salmon to levels of abundance and productivity sufficient to support sustainable runs and annual harvests".

The Mid-Columbia coho project is initiating scoping for an EIS in early 1998. Because of the experimental focus in the first few years, the BPA environmental staff has determined that the project qualifies for a categorical exclusion. The EIS will be a cooperative effort between several agencies including YIN, BPA, US Forest Service, Colville Tribe, US Fish and Wildlife Service, and WDFW.

Section 9. Key personnel

Tom Scribner, YIN Project Manager. One third FTE. Oversees all activities related to the project i.e. planning, reports, budgeting, permitting, NEPA, interagency coordination.

EDUCATION

| | |
|---------|---------------------------------|
| 1975-77 | <u>University of Washington</u> |
| | Master of Science Degree, 1977 |
| | Major: Fisheries |

Thesis: "The Relationship Between Growth and Population Density of Sockeye Salmon Fry." The study was undertaken to help determine the growth potential of sockeye in natural lake systems.

1967-71

Middlebury College
Bachelor of Arts Degree, 1971
Major: Biology (Dean's List)

EXPERIENCE

7/82 -
present

Yakima Indian Nation

Title: Fisheries Enhancement Manager

Oversee all salmon and trout production for the Tribe including all fish propagation/outplantings done by the Yakima Nation or any other fisheries agency.

Tribal representative on the Integrated Hatchery Operations Team. The team's purpose is to both develop and coordinate regional hatchery policies concerning fish health, genetics and ecological conditions and to provide hatchery performance standards. The team is also developing a hatchery audit procedure and policy implementation plans.

Tribal representative on the Production Advisory Committee (PAC) established to exchange information and to review and analyze present and future artificial and natural production programs pursuant to the U.S. v. Oregon Columbia River Fish Management Plan. Committee Chairman, 1993; re-elected for 1994 and 1995.

Tribal representative on the Mid-Columbia, Rock Island, and Wells Dam Coordinating Committees. The interagency committees are responsible for implementing measures to protect migrating salmonids, i.e. spill, bypass, adult passage and hatchery compensation for calculated dam losses.

Technical representative on interagency work groups responsible for tasks associated with: 1) the design of a \$25 million supplementation hatchery; and 2) the conceptualization of the various experiments on supplementation to be conducted at the hatchery.

Tribal representative on Northwest Power Planning Council's Hatchery Effectiveness Research Technical Work Group and

CBFWA's Anadromous Fish Production Committee. Both groups develop project recommendations regarding hatchery and natural production.

Represented four Columbia River Tribes in developing Phase I of the Enhancement Plan of the Salmon and Steelhead Enhancement Act of 1980. Served on two technical work groups developing criteria to review facility design and species interaction.

Title: Production Manager

PUBLICATIONS

M.S. Thesis, 1977. Relationship Between Growth and Population Density in Sockeye Salmon Fry, 111 pgs.

"Recommendation for Proposal and Evaluation of Salmonid Facilities", 84 pgs. (Publication for Congressional Act; Salmon and Steelhead Enhancement Act, 1980).

"Evaluation of Potential Species Interaction Effects in the Planning and Selection of Salmonid Projects", 72 pgs. (same publication conditions as above).

Scribner, T.B. 1993. "Spring Chinook Spawning Ground Surveys of the Methow River Basin." Report to Public Utility District No. 1 of Douglas County. Yakima Indian Nation, Fisheries Resource Management Program. Toppenish, WA.

SCIENTIFIC SOCIETIES

- American Fisheries Society
- The Nature Conservancy
- Native American Fish and Wildlife Society

Joel Hubble, YIN Research Biologist. One third FTE. Supervises activities related to Monitoring and Evaluation. Develops objectives and strategies to evaluate success and associated risks of the project. Works with research personnel from WDFW.

Yakama Indian Nation, Fish. Res. Management, Toppenish, WA 1993 - Present

Fisheries Biologist III (research biologist)

My primary responsibility is to develop monitoring/evaluation studies for various tribal fisheries projects, and to provide oversight in the implementation of these field studies. I'm most involved with the BPA funded Yakima/Klickitat Fisheries Project (YKFP) and the Douglas PUD funded Methow Basin Spring Chinook Supplementation Project (project leader).

I have oversight of the BPA funded video adult fish monitoring project in the Yakima basin which is part of the YKFP.

Since fall 1995 I have participated in Ecosystem Diagnosis Treatment (EDT) modeling of the Yakima Basin steelhead and fall chinook populations.

Other responsibilities include preparation of annual work statements and budgets; data analysis and annual report writing; and the direct supervision of two field biologists and three video monitoring fisheries technicians.

Yakama Indian Nation, Fish. Res. Management, Toppenish, WA 1989 - 1993

Fisheries Biologist II

Project Leader for the BPA funded Yakima/Klickitat Fisheries Project. Duties included oversight of the YIN's work statement, preparation of the annual budget, work plan and report, and oversight of field research activities and data analysis.

Yakama Indian Nation, Fish. Res. Management, Toppenish, WA 1982 - 1988

Fisheries Biologist I

Field biologist for the BPA funded Yakima Basin Spring Chinook Enhancement Study. Duties included supervision of field crews, collection of field data, data analysis and report writing.

EDUCATION

Master of Science, Biology

Central Washington University, Ellensburg, Washington- 1992

Thesis research focused on the juvenile life history of steelhead salmon in intermittent tributaries to the Satus Basin.

Bachelor of Science, Fisheries

University of Washington, Seattle, Washington- 1978

Pre-Fisheries transfer student

Everett Community College, Everett, Washington- 1975

Joe Blodgett, YIN Production Biologist. One quarter FTE Supervises all fish propagation activities for the project. Develops facility needs, O & M budgets, and biological criteria for all fish rearing operations with the project.

EDUCATION

1994-1997 Central Washington University
Bachelor of Science
Major: Fish Biology

1989-1992 Mt. Hood Community College
Associate of Applied Science
Major: Fishery Techniques

EXPERIENCE

6/97-Present Yakama Indian Nation
Title: Fisheries Biologist

Assists and supervises fish enhancement/supplementation projects done by the Yakama Indian Nation. Projects include Yakima fall chinook, Yakima coho, Mid-Columbia coho, K-Basin fall chinook, and sturgeon enhancement programs. Primarily responsible for: 1). determining biological criteria for fish; 2). Scheduling fish rearing activities. 3). Monitoring success of rearing facilities. 4). Developing plans for future improvements to hatcheries/acclimation sites. Assist in preparing and managing yearly budgets.

9/89-6/97 Yakama Indian Nation
Title: Fish Culturist IV

Worked at Bonneville Fish Hatchery under the BPA training and education program. Duties included activities involved with salmon hatchery operations. Spawned adult chinook brood, worked in the egg incubation building assisting in salmon egg fertilization, enumeration and propagation activities. Worked with the juvenile salmon through the rearing period from the fry to the smoltification stage. Performed daily maintenance of hatchery facility.

Worked for YIN on fall chinook and coho acclimation projects. Surveyed potential rearing sites and assisted in designing acclimation/hatchery sites. Responsible for developing feed schedules and other rearing activities. Monitored all aspects of fish culture related to the project including fish health and growth. Other duties included: 1). 1). Snorkeling surveys 2). Electrofishing for juvenile and adult brood salmon 3).

Evaluating adult capture techniques. 4). Assessing stream habitat 5). Spawning ground surveys.

Section 10. Information/technology transfer

A thorough response for this section is discussed above in the last couple of paragraphs of part d of Section 7 - Adaptive Management. Inter-tribal workshops and retreats are often events where scientific information is exchanged. The *U.S. v. Oregon* Production Advisory Committee monthly meetings are forums for information transfer from this project. Updates of project results to the monthly meeting of the Mid-Columbia Coordinating Committee (comprised of all resource managers plus Mid-Columbia P.U.D.s and established under FERC) will be periodically presented. As in the past, NPPC Fish and Wildlife Program reviews will be a forum for project updates.